CLAIMS

What is claimed is:

1. A coherent radio frequency ("RF") digital data communication system for mitigating the loss of digital data among segments of a transmitted message following the trailing edge of a jamming ("J") pulse that strikes a transmitted message,

the system comprising the following elements, in combination,

a transmitter having multiple digital data processing elements including a forward error correcting ("FEC") encoder, an interleaver ("I") and a differential encoder ("DE"), aligned with an outward path from one element to the next traveled by a message for preparing the message for processing by complementary processing elements at a receiver to which a transmitted message is addressed,

a receiver having multiple, digital data processing elements that are the complements to those of the transmitter including a FEC decoder, a de-interleaver ("DI") and a differential data decoder ("DDE") within a path for processing an incoming digital data message having lost a data segment to a J pulse during transmission,

wherein,

the DDE synchronizes with either incoming data bit pairs, or inverted data bit pairs, among remnant segments of a message following the trailing edge of an expired J pulse that struck a transmitted message and incoming inverted data bit pairs, allowing the DDE to sequentially process received remnant data segments of a message created by the J pulse thereby allowing the DI and the FEC decoder to sequentially process the received remnant data segments.

2. The coherent RF digital data communication system of claim 1 wherein the differential encoder ("DE") tx3e of transmitter Tx3 is located near transmitter Tx3g and the differential decoder ("DDE") Rx4d of receiver Rx4 is located near receiver Rx4b.

3. The coherent RF digital data communication system of claim 1 wherein a spread spectrum modulator ("SSM") element Tx3f is positioned within transmitter Tx3 between the DE Tx3e and receiver transmitter Tx3h for spreading a transmitted message and a spread spectrum demodulator ("DDE") is positioned within receiver Rx4 between the DDE Rx4d and receiver Rx4b for de-spreading a received message.

4. The coherent RF digital data communication system of claim 1 wherein transceiver Tx3 further includes a multiplexer ("MUX")Tx3a and an encrypter ("ENCYPT") coupled to the FEC coder Tx3e and other elements of transmitter Tx3 in alignment with an outgoing message and

wherein receiver Rx4 further includes a de-multiplexer ("DMUX")Rx4h and a de-encrypter ("DE-CRYPT") Rx4g coupled

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to the FEC decoder Rx4e and other elements of receiver Rx4 in alignment with an incoming message.

5. The coherent RF digital data communication system of claim 1 wherein receiver Rx4b includes a burst clamp to enable the receiver to recover coherence with an incoming message following the trailing edge of a J pulse that strikes a transmitted message.

6. The coherent RF digital data communication system of claim 5 wherein the burst clamp is located within an automatic gain controller ("AGC") to protect a signal detection diode within a feedback loop of the AGC for rapid coherence recovery with remnant data of a message struck by a J pulse.

7. The coherent RF digital data communication system of claim 3 wherein the SSDM Rx4c includes a pseudorandom number ("PN") slip circuit to inhibit temporarily dispreading of received data to verify the loss of coherence recovery is due to a strike of an incoming message by a J pulse.

8. A coherent radio frequency ("RF") digital data communication method for mitigating the loss of digital data among segments of a transmitted message following the trailing edge of a jamming ("J") pulse that strikes a transmitted message, the method comprising the following combination of steps,

at a transmitter,

forward error correcting "FEC"), interleaving ("I") and differential encoding ("DE")a message for preparing a message for processing at a receiver Rx4,

at a receiver Rx4,

receiving the transmitted message for correcting data errors within the received message by performing complementary steps to those performed on the message at the transmitter including differential data decoding ("DDE"), de-interleaving ("DI") and forward error correcting ("FEC") the received message, and

recovering incoming message data including remnant message data of a message hit by a J pulse by performing the DDE step near the output of receiver Rx4b by synchronizing with incoming data bit pairs and inverted data bit pairs thereby synchronizing rapidly to the incoming message at each down stream element.

9. The coherent RF digital data communication method of claim 8 wherein the differential encoding step("DE") tx3e at the transmitter Tx3 occurs just prior to transmitting the message and the differential decoding ("DDE") Rx4d of the message occurs just after receiving the transmitted message by receiver Rx4.

10. The coherent RF digital data communication method of system of claim 8 including the steps of spreading the transmitted message at spread spectrum modulator ("SSM") element Tx3f prior to transmitting Tx3g the message and de-

spreading the message after receiving the message at receiver Rx4b.

11. The coherent RF digital data communication method of claim 8 including the steps at the transmitter of multiplexing a message at multiplexer ("MUX") Tx3a and encrypting ("ENCYPT") the message prior to transmitting the message to the receiver and at the receiver de-encrypting the received message and de-multiplexing the message.

12. The coherent RF digital data communication method of claim 8 further including the steps of burst clamping the receiver Rx4b for enabling recovery coherence with an incoming message following the trailing edge of a J pulse that strikes a transmitted message.

13. The coherent RF digital data communication method of claim 12 wherein the step of burst clamping is performed is within an automatic gain controller ("AGC") for protecting a signal detection diode within a feedback loop of the AGC for rapidly obtaining coherence recovery with remnant data of a message struck by a J pulse.

14. The coherent RF digital data communication system of claim 13 wherein the step of SSDM Rx4c demodulating includes inhibiting a pseudorandom number ("PN") slip circuit for temporarily delaying the de-spreading of received data to verify the loss of coherence recovery due to a strike of an incoming message by a J pulse.